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10/529,400

03/28/2005

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EXAMINER

PATEL, HARSHAD R

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/529,400  
Filing Date: March 28, 2005  
Appellant(s): SAKAI ET AL.

**MAILED**  
**JAN 28 2008**  
**GROUP 2800**

Stephen M. Hertzler  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed November 13, 2007 appealing from the Office action mailed February 16, 2007 and Advisory action filed on May 25, 2007.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

20040050176

Ohnishi

3-2004

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art (APA) in view of Ohnishi (Pub. # 20040050176).

Applicant admits the known device teach a flowmeter having first and second ultrasonic wave generating and detecting piezoelectric devices that alternately transmit and receive ultrasonic waves and the time being determined between each transmitter and receiver and based upon the difference the flow rate being determined. The only inventive feature in the instant invention is the use of the shock-wave (Oscillation Wave) generating piezoelectric element. Ohnishi teaches the use of oscillation wave generating and receiving piezoelectric devices in the same arrangements as the APA positions the ultrasonic piezoelectric transducers. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to use the oscillation wave generating and receiving piezoelectric elements for the known ultrasonic wave generating and receiving piezoelectric elements since such are mere alternatives that would function equally in the environment of measuring flow in a conduit without being in direct contact with the fluid. As to the impulse voltage with a steep rising edge and steep falling edge, it would have been an inherent characteristics of the oscillating wave compared to the ultrasonic wave.

**(10) Response to Argument**

Appellant's arguments filed 1/25/07 have been fully considered but they are not persuasive. Regarding the arguments (page 7) that the cited references do not teach alone or in combination the shock wave feature of the invention, it is noted that as originally disclosed, appellant has admitted that the oscillation wave is regarded as a shock wave (page 4, lines 23-24). Thus such an admittance is acknowledged as an alternative type or name of a wave applied to a piezoelectric element. Appellant indicates that the examiner is incorrectly asserting that the shock wave of the invention is identical to an oscillation wave. However, to direct the appellant's attention on page 4, lines 18-28, such language is disclosed that indicate the oscillation wave is also a shock wave.

As a result, they have discovered that if the sine wave alternating energy employed in the conventional system for applying the energy to the piezoelectric element is replaced with a shock energy caused by application of an impulse voltage having steep rising edge or steep falling edge, *an oscillation wave (i.e., shock wave)* received by a wave-receiving piezoelectric element after generation and transmission in a flowing fluid gives a simpler wave form and hence the determination of the target point for the measurement of transmission period is facilitated.

Thus the assertion by the examiner of the oscillation wave to be a shock wave is not incorrect.

Moreover, the argument that not every oscillation wave is necessarily a shock wave is acknowledged. The appellant also argues that the oscillation wave of Ohnishi is not a shock wave. However, it is known that when an impulse of voltage is applied to a piezoelectric element, a shock is generated which may be in form of an oscillation having a steep rise or fall, which is shown by Ohnishi in Figs. 4, 6, 8 and 12. These waveforms are based on an application of voltage to the transducers that would generate a wave in the flow that are detected by the second transducer either upstream or downstream from the first location. The waves of Ohnishi

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are shocks that are pulsed at an instance and later shown as an oscillation prior to be detected by the receiving unit at time "To" as wave S<sub>2</sub>. Thus any wave generated by a voltage applied to a piezoelectric element would be an impulse having a steep rise or fall as shown by Ohnishi.

Therefore, although Ohnishi does not use the term, "shock wave", since the oscillation wave of Ohnishi performs the same function as the shock wave of the instant specification; the oscillation wave is a shock wave.

Furthermore, the argument (page 9) that the inventive idea of Ohnishi resides in the use of an oscillation wave transmitted in the wall for the flow rate measurement contradicting the conventional flow rate measuring method utilizing an oscillation wave transmitted in the moving fluid. Such arguments are not persuasive as Ohnishi shows in Fig. 1, that the wave 9 is transmitted through the wall through the moving fluid by the transducers mounted on the flow tube. As to the application of an impulse voltage with a steep rising or falling edge, such a steep rising and falling edge of the impulse voltage is shown in the waves of Figs. 4, 6, 8 and 12.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

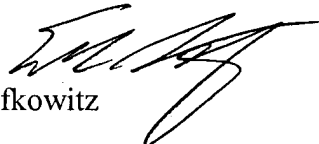
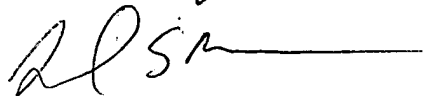


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January 22, 2008

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